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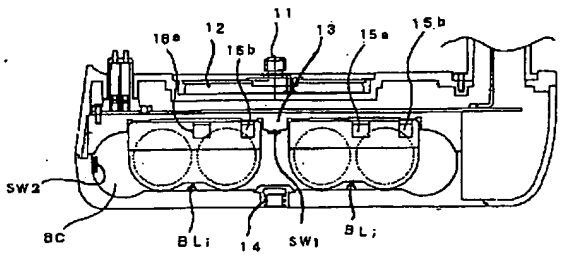
(71)出願人　000004112
株式会社ニコン
東京都千代田区丸の内３丁目２番３号
(72)発明者　千々岩　智樹
東京都千代田区丸の内３丁目２番３号　株式会社ニコン内
(74)代理人　100084412
弁理士　永井　冬紀

最終頁に続く

(54)【発明の名称】カメラおよびカメラ用給電装置

(57)【要約】
【課題】　電源電池の違いによる悪影響を極力防止し、また同一電池であっても使用方法を変えることで高機能を達成できるようにする。
【解決手段】　特性の異なる複数種類の電源電池が選択的に使用可能であり、電源電池の種類を識別し、その識別結果に応じてカメラ動作を制御する。例えば、電池によって機能を制限したり、撮影者への報知形態を変えるようにする。また複数個の電源電池を直列接続で使用するか並列接続で使用するかを切換えられるようにする。例えば直列接続にすればより高速で連写が行え、並列接続にすれば電池が長持ちする。

【図１】



【特許請求の範囲】
【請求項１】　特性の異なる複数種類の電源電池が選択的に使用可能なカメラであって、
前記電源電池の種類を識別し、その識別結果に応じてカメラ動作を制御する制御手段を具備することを特徴とするカメラ。
【請求項２】　前記制御手段は、前記識別結果に応じて特定の機能の使用を許可／禁止することを特徴とする請求項１に記載のカメラ。
【請求項３】　撮影者に報知を行うための報知手段を備え、前記制御手段は、前記識別結果に応じて特定の機能に関する報知形態を変更することを特徴とする請求項１に記載のカメラ。
【請求項４】　前記電源電池の特性は、持続特性および／または使用方法に応じた劣化特性を含むことを特徴とする請求項１～３のいずれかに記載のカメラ。
【請求項５】　前記特性の異なる複数種類の電源電池は、少なくともリチウムイオン電池およびニッケル水素電池を含むことを特徴とする請求項４に記載のカメラ。
【請求項６】　複数個の電源電池を使用するカメラであって、
前記複数個の電源電池を直列接続で使用するか並列接続で使用するかを切換えるスイッチ機構を設けたことを特徴とするカメラ。
【請求項７】　前記直列接続状態か並列接続状態かに応じてカメラ動作を制御する制御手段を更に備えることを特徴とする請求項６に記載のカメラ。
【請求項８】　特性の異なる複数種類の電源電池が選択的に装填される電池室と、
前記装填された電源電池の種類に応じてメカ的に切換わり、電池識別信号を出力する信号出力手段とを備えることを特徴とするカメラ用給電装置。
【請求項９】　複数の電源電池が装填される電池室と、一定の電池装填状態のまま前記複数の電源電池を直列接続する状態と並列接続する状態とで切換可能な切換機構とを備えることを特徴とするカメラ用給電装置。
【請求項１０】　複数の電源電池が装填される電池室を有するとともに、底部に三脚座を備えたカメラ用給電装置であって、
前記複数の電源電池を位置決めするために前記電池室の内面に位置決め用突起を突設し、該突起によって位置決めされたいずれか２個の電源電池の間に前記三脚座が位置するよう該三脚座の位置を定めたことを特徴とするカメラ用給電装置。
【請求項１１】　形状の異なる第１，第２の電源電池が選択的に装填可能な電池室を有し、該電池室には、複数の第１の電源電池にそれぞれ対応する複数の電池接点が設けられ、前記第２の電源電池が装填されたときには、該複数の電池接点のうちの一部を使用するよう構成したことを特徴とするカメラ用給電装置。
【請求項１２】　請求項１０または請求項１１の給電装置を有するカメラ。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は、特性や形状の異なる複数種類の電池を選択的に使用可能なカメラおよびカメラ用給電装置に関する。
【０００２】
【従来の技術】従来、専用のニッケル水素二次電池（Ni-MH電池）と汎用の単３形一次電池（以下、単３電池）とを選択的に使用可能なカメラ用バッテリパックがある。通常は大容量のニッケル水素電池を使用し、これが切れたときに入手し易い単３電池を応急的に使用するといった利用方法が一般的である。単３電池の使用にあたっては、専用の単３電池ホルダに単３電池を複数本（例えば８本）装着すると、１個のニッケル水素電池とほぼ同等の形状となるので、これをニッケル水素電池に代えて装填して用いる。また、リチウムイオン（Li-ion）電池と単３電池とを選択的に使用可能なものもある。
【０００３】
【発明が解決しようとする課題】しかしながら、複数種類の電池は、単に形状や容量が異なるばかりでなくその劣化等の特性も異なるため、これらの特性を考慮して使用しないと所望のカメラ性能が得られなかったり、電池自身の劣化を招くおそれがある。
【０００４】本発明の目的は、電源電池の違いによる悪影響を極力防止し、また同一電池であっても使用方法を変えることで高機能を達成できるようにしたカメラおよびカメラ用給電装置を提供することにある。
【０００５】
【課題を解決するための手段】請求項１～５の発明に係るカメラは、特性の異なる複数種類の電源電池が選択的に使用可能なカメラであって、電源電池の種類を識別し、その識別結果に応じてカメラ動作を制御する制御手段を具備し、これにより上記問題点を解決する。特に請求項２の発明は、上記識別結果に応じて特定の機能の使用を許可／禁止するようにしたものである。請求項３の発明は、撮影者に報知を行うための報知手段を備え、識別結果に応じて特定の機能に関する報知形態を変更するようにしたものである。請求項４の発明は、電源電池の特性が、持続特性および／または使用方法に応じた劣化特性を含むものである。請求項５の発明は、特性の異なる複数種類の電源電池が、少なくともリチウムイオン電池およびニッケル水素電池を含むものである。請求項６，７の発明に係るカメラは、複数個の電源電池を使用するカメラであって、複数個の電源電池を直列接続で使用するか並列接続で使用するかを切換えるスイッチ機構を設けたものである。特に請求項７の発明は、直列接続状態か並列接続状態かに応じてカメラ動作を制御する制御手段を更に備えるものである。請求項８の発明に係る

カメラ用給電装置は、特性の異なる複数種類の電源電池が選択的に装填される電池室と、装填された電源電池の種類に応じてメカ的に切換わり、電池識別信号を出力する信号出力手段とを備えるものである。請求項９の発明に係るカメラ用給電装置は、複数の電源電池が装填される電池室と、一定の電池装填状態のまま前記複数の電源電池を直列接続する状態と並列接続する状態とで切換可能な切換機構とを備えるものである。請求項１０の発明に係るカメラ用給電装置は、複数の電源電池が装填される電池室を有するとともに、底部に三脚座を備えたカメラ用給電装置であって、複数の電源電池を位置決めするために電池室の内面に位置決め用突起を突設し、突起によって位置決めされたいずれか２個の電源電池の間に三脚座が位置するよう三脚座の位置を定めたものである。請求項１１の発明に係るカメラ用給電装置は、形状の異なる第１，第２の電源電池が選択的に装填可能な電池室を有し、電池室には、複数の第１の電源電池にそれぞれ対応する複数の電池接点が設けられ、第２の電源電池が装填されたときには、複数の電池接点のうちの一部を使用するよう構成したものである。請求項１２の発明に係るカメラは、請求項１０または請求項１１の給電装置を有するものである。

【０００６】

【発明の実施の形態】－第１の実施形態－

図１～図４により本発明をデジタルスチルカメラ用のバッテリパック（給電装置）に適用した場合の第１の実施形態を説明する。本実施形態のデジタルスチルカメラは、ニッケル水素電池，リチウムイオン電池および単３形一次電池が選択的に使用可能であり、専用のバッテリパックをカメラ本体に装着することでカメラへの給電が可能となる。なお、バッテリパックを装着せずにカメラ単独でも使用可能である。

【０００７】図１～図３はバッテリパックの電池室ＢＣにそれぞれの電池を装着した状態を示している。このバッテリパックは、上面に突設したねじ１１をカメラ本体底部の三脚ねじ孔にねじ込んで装着するタイプのものである。図示左右方向がカメラ横方向に対応する。１２はねじ１１を回転させるための円盤部材であり、その一部がバッテリパック本体の側面から操作可能に露出している。

【０００８】図１に示すリチウムイオン電池ＢＬｉは、２セルを１つの電池パッケージに収容して成る。１セルが３．７Ｖなので、１個のリチウムイオン電池ＢＬｉとしては７．４Ｖとなる。本実施形態ではこのリチウムイオン電池ＢＬｉを２個装填し、並列で使用する。なお、リチウムイオン電池１個のみでも使用可能である。一方、図２に示すニッケル水素電池ＢＮｉは１セル１．２Ｖであり、６セルを１つの電池パッケージに収容し７．２Ｖの電池として用いる。また図３に示す単３電池ＢＡＡは、１個１．５Ｖのものを６個直列接続し、９Ｖで用いる。単３電池を６本直列接続可能に保持する単３電池ホルダＨＬが用意されており、このホルダＨＬをリチウムイオン電池ＢＬｉやニッケル水素電池ＢＮｉに代えて装着する。

【０００９】１５ａ(+)，１５ｂ(-)，１６ａ(+)，１６ｂ(-)は電池接点であり、２個のリチウムイオン電池ＢＬｉを並列接続するために左右１組づつ設けられている。このうちいずれか１組の(+)(-)電池接点（１５ａ，１５ｂか１６ａ，１６ｂか１５ａ，１６ｂか１５ｂ，１６ａ）はニッケル水素または単３電池装填時の電池接点としても用いられる（ニッケル水素および単３電池ＢＡＡは直列接続されるため、１組のみでよい）。

【００１０】電池室ＢＣの上面には、左右方向のほぼ中央位置に電池位置決め用の突起１３が突設されている。２個のリチウムイオン電池ＢＬｉは、突起１３を挟んで両側に１個ずつ装填されるが、その際に突起１３により位置決めされる。またニッケル水素電池ＢＮｉおよび単３電池ホルダＨＬもこの突起１３を用いて位置決めがなされるようその形状が定められている。そして、この突起１３の真下に三脚座１４が設けられている。三脚座１４には三脚や一脚を固定するためのねじ孔が設けられ、これを利用してバッテリパックを装着したカメラを三脚に固定する。

【００１１】ここで、三脚座１４の上部は図示の如く電池室ＢＣ内に突出しているため、その配置位置によっては電池装填の邪魔になる。三脚座１４が電池室ＢＣ内に突出しないようにすれば電池との干渉は防げるが、この場合はバッテリパックの底部の肉厚を厚くしなければならず、高さ寸法が増す。突起１３の真下に三脚座１４を配置すれば、図１のようにリチウムイオン電池ＢＬｉを装填したとき、突起１３によって位置決めされた２個のリチウムイオン電池ＢＬｉの間に三脚座１４が位置することになり、三脚座１４が電池室ＢＣ内に突出していても電池ＢＬｉと干渉することはない。換言すれば、三脚座１４を突起１３の真下に配置することで三脚座１４を電池室ＢＣ内に突出させることができ、これによりバッテリパックの高さ寸法を最小限に抑えることができる。

【００１２】次に、各電池の特性について説明する。リチウムイオン電池ＢＬｉは、ニッケル水素電池ＢＮｉと比べて大容量であり、本実施形態のようにリチウムイオン電池ＢＬｉを２個用いる場合は、ニッケル水素電池ＢＮｉを１個用いる場合と比べて約１．５倍の容量がある。つまりニッケル水素電池ＢＮｉと比べて持続特性が高い。また、ニッケル水素電池ＢＮｉで問題となるメモリ効果（後述する）がないという利点もある。その反面、リチウムイオン電池ＢＬｉは低温に弱く、また大電流（ラッシュ電流）によって性能が劣化し、寿命を縮めるという欠点がある。

【００１３】一方、ニッケル水素電池ＢＮｉは、大電流によって性能が劣化することはないが、容量的にリチウムイオン電池ＢＬｉより劣り、またメモリ効果という欠点が

ある。メモリ効果とは、電池内の電力を完全に放電しないで再充電を行なうと、そのときの充電レベルを電池が記憶してしまい、再放電後もそのレベルに達すると、電力は残っているにもかかわらず電力供給を停止してしまう特性をいう。なお単３電池ＢＡＡは、容量的に先の２つの二次電池よりも大幅に劣り、また電圧降下が激しいなどの欠点がある一方、汎用であるが故に入手し易いという利点がある。

【００１４】このように３種類の電池はそれぞれ異なる特性を有するため、本実施形態では装填されている電池の特性に合わせてカメラ動作を制限するようにした。まず装填されている電池を識別するために、図１～図３に示すように２つのスイッチＳＷ１，ＳＷ２を電池室ＢＣに設けた。これらのスイッチＳＷ１，ＳＷ２は一対の電気接片から成り、それぞれ電池室ＢＣのほぼ中間に突設された突起１３の先端と、電池室ＢＣの一内側面とに設けられる。

【００１５】スイッチＳＷ１は、図１のようにリチウムイオン電池ＢＬｉが装填されたときにはオフ状態を保持し、図２，図３のようにニッケル水素電池ＢＮｉ，単３電池ホルダＨＬが装填されたときには、一方の接片が電池ＢＮｉ，ホルダＨＬ押されることで他方の接片に接触し、オン状態となる。一方、スイッチＳＷ２は、ニッケル水素電池ＢＮｉが装填されたときにのみ押されてオンし、リチウムイオン電池ＢＬｉ，単３電池ホルダＨＬが装填されたときにはオフ状態を保持する。スイッチＳＷ１，ＳＷ２のオン・オフ状態は、カメラ側のＣＰＵ２１（図４）に電池識別信号として伝達され、これによりＣＰＵ２１は装填されている電池の種類を識別する。すなわち、

ＳＷ１，ＳＷ２がともにオフであればリチウムイオン電池ＢＬｉ

ＳＷ１，ＳＷ２がともにオンであればニッケル水素電池ＢＮｉ

ＳＷ１がオンで、ＳＷ２がオフであれば単３電池ＢＡＡ

のように判定する。

【００１６】ＣＰＵ２１にはまた、モータＭの駆動回路２２と、表示回路２３と、閃光装置の発光回路２４とが接続されている。モータＭは１個のみ示したが、実際にはミラーや絞り，シャッタ等を駆動するシーケンスモータ，内蔵閃光装置の発光部をポップアップ／ダウンさせるためのモータ等、複数のモータを含んでいる。また本実施形態ではデジタルスチルカメラを想定しているが、銀塩カメラであればフィルム給送モータも含まれる。表示回路２３は、カメラ本体に設けられた画像確認用の液晶モニタ２５を駆動するものである。なお、バッテリパックから給電経路については図示を省略してある。

【００１７】次にＣＰＵ２１の処理の具体例を説明する。ＣＰＵ２１は、例えばカメラのメインスイッチがオンされたり、あるいは新たに電池が装填されると上記スイッチＳＷ１，ＳＷ２による電池判別を行う。そして、装填されている電池に応じて以下のような制御を行う。

まず連続撮影（連写）に関しては、

ＢＬｉであれば連続撮影禁止

ＢＮｉであれば連続撮影許可

ＢＡＡであれば連続撮影禁止

とする。すなわち、高速で連続撮影を行うと大電流が流れるが、リチウムイオン電池ＢＬｉは大電流によって性能が劣化するという欠点があるため、リチウムイオン電池ＢＬｉでの連続撮影は禁止する。一方、ニッケル水素電池ＢＮｉはリチウムイオン電池ＢＬｉと比べて小容量であるものの、大電流によって性能が劣化することは少ないので連続撮影を許容する。また単３電池ＢＡＡは容量も小さく電圧降下が激しいので連続撮影は禁止する。

【００１８】ここで、「連続撮影を禁止する」とは、撮影者が１駒撮りモードから連続撮影モードへ切換えようとしてもその切換えを阻止ことを意味する。また既に連続撮影モードが設定されていた場合には、強制的に１駒撮りモードに切換える。これに同期して、連続撮影禁止の旨の警告（報知）を行うことが望ましい。あるいは連続撮影を禁止せず、単に警告のみでもよい。つまりリチウムイオン電池ＢＬｉや単３電池ＢＡＡのときには連続撮影が不適である旨の警告を行い、ニッケル水素電池ＢＮｉのときには連続撮影が問題なく行える旨の警告を行うようにすればよい。これらの警告としては、上記液晶モニタ２５や他の液晶表示装置による警告表示、警告用ＬＥＤの点灯、あるいは警告音の発生等が考えられる。

【００１９】また、連写速度が可変のものでは、装填された電源電池に応じて連写速度を変えるようにしてもよい。例えば、

ＢＬｉであれば２駒／秒

ＢＮｉであれば５駒／秒

ＢＡＡであれば１駒／秒

のようにすることが考えられる。すなわち、さほど高速の連続撮影でなければリチウムイオン電池ＢＬｉでも劣化することはないので、その速度を制限して連続撮影を許容する。

【００２０】さらに上述したようなポップアップ式の閃光装置を備え、必要時には自動的にポップアップして撮影を行う自動ポップアップ機能を備えたカメラの場合、

ＢＬｉであれば自動ポップアップ禁止

ＢＮｉであれば自動ポップアップ許可

ＢＡＡであれば閃光撮影禁止

のようにしてもよい。リチウムイオン電池ＢＬｉのときに自動ポップアップを禁止するのは、ポップアップ直後の撮影時の動作を減らすことで大電流が流れるのを防止するためである。なお単３電池ＢＡＡは容量が小さいので、閃光発光そのものを禁止する。

【００２１】また液晶モニタ２５は多くの電力を必要とするため、

ＢＬｉであればモニタ常時使用可

BNiであればモニタ条件付きで使用可
BAAであればモニタ使用不可
としてもよい。つまり大容量のリチウムイオン電池BLiでは液晶モニタ２５の使用を常に許容するが、それより容量の小さいニッケル水素電池BNiでは条件付きで使用を許可する。条件付き使用に関しては、例えば液晶モニタ２５をファインダ代わりとしては使用できないが、撮影画像の確認はできる、あるいはその逆が考えられる。また、１駒の撮影後に一定時間だけ撮影画像を液晶モニタに表示するものでは、リチウムイオン電池BLiおよび液晶モニタ２５のときにはその表示を許容し、単３電池BAAのときのみ禁止するようにしてもよい。

【００２２】さらにはリチウムイオン電池が低温に弱いことに鑑み、雰囲気温度が所定温度未満でリチウムイオン電池が装填されている場合には電池交換を促す警告を行うようにしてもよい。またメモリ効果を回避するために、ニッケル水素電池が装填されたときに完全に放電してから充電を行う旨の警告を行うようにしてよい。

【００２３】なお以上では、給電装置としてのバッテリパックをカメラ本体に装着して用いる例を示したが、給電装置がカメラ本体に予め一体化されているものにも本発明を適用できる。

【００２４】－第２の実施形態－
次に、本発明の第２の実施形態を説明する。図５，図６は本実施形態におけるカメラシステムの制御系を示すブロック図である。ここでいうカメラシステムは、カメラと給電装置とから成るシステムを意味し、これらが予め一体化されているものでもよいし、先の実施形態のようにバッテリパック等の給電装置がカメラに着脱可能なものでもよい。なお、先の実施形態と同様の構成要素には同一の符号を付す。

【００２５】このカメラシステムでは２個のリチウムイオン電池BLiが使用可能とされるが、これらを並列接続で用いるか直列接続で用いるかをスイッチＳＷ１１～ＳＷ１３により切換可能となっている。スイッチＳＷ１１～ＳＷ１３は電池とＤＣ／ＤＣ回路３１との間に位置し、所定の操作部材３２の操作により切換えられる。操作部材３２は、例えばカメラあるいはバッテリパックの外面にスライド操作可能に設けられ、直列位置と並列位置との間で操作可能とされる。

【００２６】図５は操作部材２１が並列位置にある状態を示し、スイッチＳＷ１１，ＳＷ１２がオン、スイッチＳＷ１３がオフであり並列接続となっている。このときの電源電圧は７．４Ｖである。操作部材３２を直列位置に操作すると、図６に示すようにスイッチＳＷ１１，ＳＷ１２がオフ、スイッチＳＷ１３がオンとなり、電池BLiが直列接続され、電源電圧は１４．８Ｖとなる。このように操作により切換わるスイッチＳＷ１１～ＳＷ１３を用いて直列／並列を切換えるようにしたので、その切換えにあたって電池の装填位置や装填方向を変える必要はない。つまり一定の電池装填状態のまま直列／並列の切換えが行える。

【００２７】以上の構成において、例えば連写速度は電源電圧が高い方が高速で行える（モータＭを高速で回転させることができるため）ことに鑑み、高速連写を行う場合には直列接続を選択し、その他のときには並列接続を選択するといった使い分けが可能である。上記操作部材３２の操作状況はＣＰＵ２１に入力され、ＣＰＵ２１はこれにより電源電池BLiの接続状態を判定する。そして、直列接続のときには高速連写が可能である旨の表示を液晶モニタ２５等を用いて行う。例えば、直列接続のときには「５駒／秒」、並列接続のときには「３駒／秒」のような表示を行うようにしてもよい。

【００２８】また連続撮影以外でも高速で処理を行う必要がある場合には直列接続を選択し、それ以外の場合には並列接続を選択するようにすればよい。あるいは電源電池をなるべく長時間使用したい場合には、並列接続を選択するようにすればよい。また、直列接続状態であってもさほど高電圧を必要としない処理に関しては、ＤＣ／ＤＣ回路３１で電圧を落とすようにすればよい。一般に電源電圧を上げるよりも下げる方が簡単な回路構成で済み、スペースも小さくて済む。

【００２９】なお以上では、リチウムイオン電池とニッケル水素電池と単３型一次電池の３種類を示したが、他の種類の電池が使用可能なものにも本発明を適用できる。また少なくとも２種類の電池が使用可能なものであればよい。さらにデジタルスチルカメラにて説明したが、銀塩フィルムを扱うカメラでもよい。

【００３０】
【発明の効果】本発明によれば次の効果が得られる。
（１）電源電池の種類を識別し、その識別結果に応じてカメラ動作を制御するようにしたので、電池特性に応じたカメラ動作が可能となり、常に所望のカメラ性能が得られるとともに、電池自身の劣化を防止できる。
（２）複数個の電源電池を直列接続で使用するか並列接続で使用するかを切換えられるようにしたので、高速処理が求められるときには直列接続を選択して所望の機能を得る一方、それ以外のときには並列接続を選択することで電池が長時間使用できる。
（３）複数の電源電池を位置決めするために電池室の内面に位置決め用突起を突設し、突起によって位置決めされたいずれか２個の電源電池の間に三脚座が位置するよう三脚座の位置を定めたので、三脚座の一部を電池室内に突出させても電池と干渉することはなく、以て給電装置あるいはカメラの高さ寸法を小さくできる。
（４）形状の異なる第１，第２の電源電池が選択的に装填可能であり、複数の第１の電源電池にそれぞれ対応する複数の電池接点を設け、第２の電源電池が装填されたときには、複数の電池接点のうちの一部を使用するよう構成したので、電池接点の共有化による部品点数の低減

およびコストダウンが図れる。

【図面の簡単な説明】

【図１】第１の実施形態におけるバッテリパックの構成を示す断面図であり、リチウムイオン電池装填時の状態を示す。

【図２】図１と同様の図であり、ニッケル水素電池装填時の状態を示す。

【図３】図１と同様の図であり、単三形一次電池装填時の状態を示す。

【図４】上記バッテリパックが装着されるカメラの制御系を示す図。

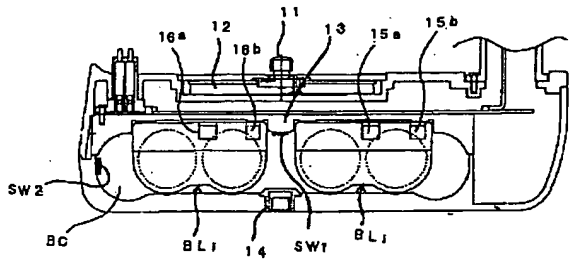
【図５】第２の実施形態におけるカメラシステムの制御ブロック図であり、電池が並列接続された状態を示す。

【図６】図５と同様の図であり、電池が直列接続された状態を示す。

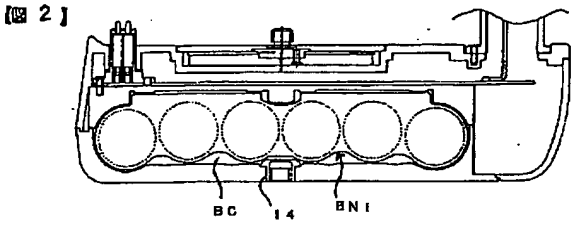
【符号の説明】

１３　位置決め用突起
１４　三脚座
２１　ＣＰＵ
２２　駆動回路
２３　表示回路
２４　発光回路
２５　液晶モニタ
ＢＣ　電池室
BLi　リチウムイオン電池
BNi　ニッケル水素電池
BAA　単三形一次電池
Ｍ　モータ
ＳＷ１，ＳＷ２　電池識別用のスイッチ
ＳＷ１１～ＳＷ１３　直列／並列切換用のスイッチ

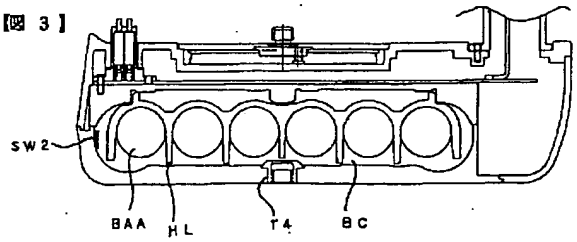
【図１】



【図２】

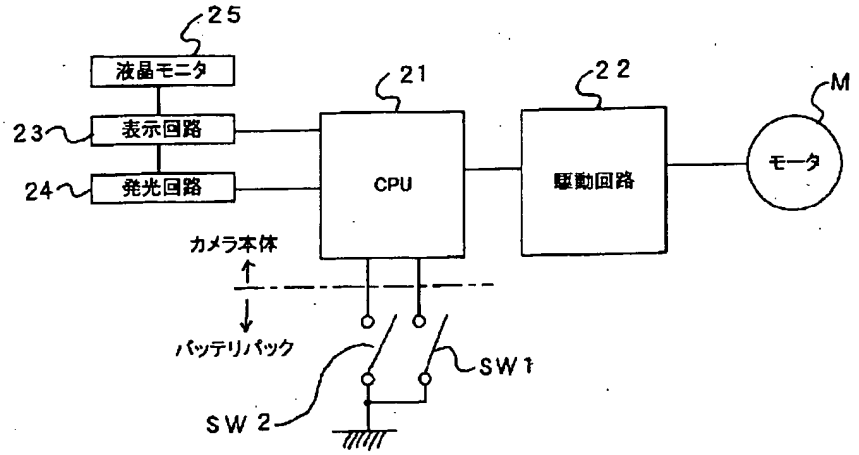


【図３】



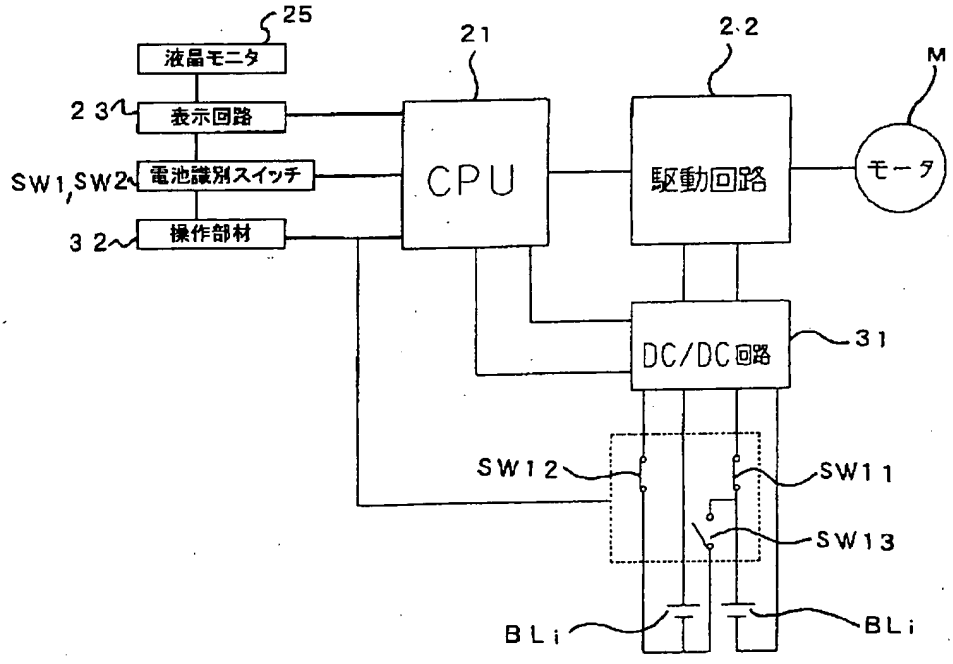
【図４】

【図4】

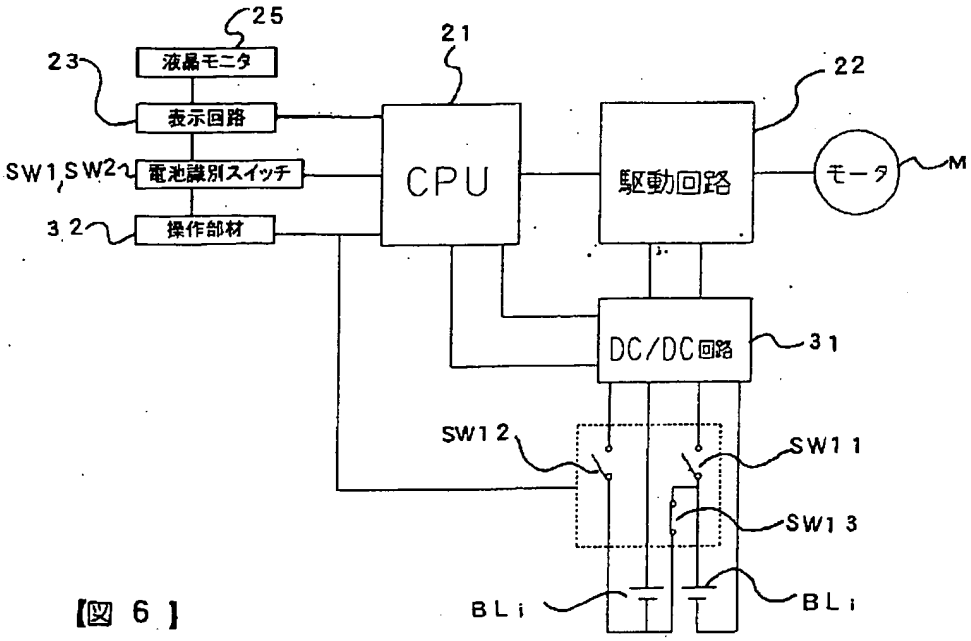

25
液晶モニタ
21
22
M
23
表示回路
CPU
駆動回路
モータ
24
発光回路
カメラ本体
バッテリパック
SW1
SW2

【図５】

【図 5 】


25
液晶モニタ
21
22
M
23
表示回路
SW1,SW2
電池識別スイッチ
CPU
駆動回路
モータ
32
操作部材
DC/DC回路
31
SW12
SW11
SW13
BLi
BLi

【図６】



【図 6】

フロントページの続き

(51)Int.Cl.'	識別記号	FI	ﾃｰﾏｺｰﾄﾞ(参考)
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2H100 BB05 DD02 DD03 DD05 DD08
2H102 BA06 BA12 BA22
5C022 AB40 AC03 AC69 AC73 AC74
AC78
5H040 AA39 AS15 GG07

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] A camera characterized by providing a control means which two or more kinds of power supply cells by which properties differ are usable cameras alternatively, identifies a class of said power supply cell, and controls camera actuation according to the discernment result.
[Claim 2] Said control means is a camera according to claim 1 characterized by responding to said discernment result, and permitting / forbidding use of a specific function.
[Claim 3] It is the camera according to claim 1 which is equipped with an information means for reporting to a photography person, and is characterized by said control means changing an information gestalt about a specific function according to said discernment result.
[Claim 4] The property of said power supply cell is a camera according to claim 1 to 3 characterized by including a self-sustaining property and/or a deterioration property according to operation.
[Claim 5] Two or more kinds of power supply cells by which said properties differ are cameras according to claim 4 characterized by including a lithium ion battery and a nickel hydoride battery at least.
[Claim 6] A camera which is a camera which uses two or more power supply cells, and is characterized by preparing a switch mechanism which switches whether said two or more power supply cells are used by series connection, or it is used by parallel connection.
[Claim 7] A camera according to claim 6 characterized by having further a control means which controls camera actuation according to said series connection condition or a parallel connection condition.
[Claim 8] A feeder system for cameras characterized by having a battery compartment where it is alternatively loaded with two or more kinds of power supply cells by which properties differ, and a signal output means to switch in mechanism according to a class of said power supply cell with which it was loaded, and to output a cell recognition signal.
[Claim 9] A feeder system for cameras characterized by having a switchable change over device in a battery compartment where it is loaded with two or more power supply cells, and the condition of changing parallel connection into the condition of carrying out series connection of said two or more power supply cells while it has been in a fixed cell loading condition.
[Claim 10] A feeder system for cameras characterized by to set a location of this tripod seat that said tripod seat is located between a gap or two power supply cells which be the feeder systems for cameras which equipped a pars basilaris ossis occipitalis with a tripod seat, protrude a projection for positioning on an inside of said battery compartment in order to position said two or more power supply cells, and be positioned by this projection while having a battery compartment where it is loaded with two or more power supply cells.
[Claim 11] A feeder system for cameras characterized by constituting so that a part of these two or more cell contacts may be used when the 1st and 2nd power supply cell by which configurations differ has alternatively a battery compartment with which it can load, two or more cell contacts corresponding to two or more 1st power supply cells are prepared in this battery compartment, respectively and it is loaded with said 2nd power supply cell.
[Claim 12] A camera which has a feeder system of claim 10 or claim 11.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] This invention relates alternatively two or more kinds of cells by which a property differs from a configuration to an usable camera and the feeder system for cameras.
[0002]
[Description of the Prior Art] the nickel hydrogen rechargeable battery (nickel-MH cell) of the former and dedication, and general-purpose AA -- there is an usable battery pack for cameras alternatively about a form primary cell (the following, size AA battery). Usually, the usage of using a mass nickel hydoride battery and using temporarily the size AA battery which is easy to come to hand when this goes out is common. If two or more (8 [for example,]) wearing of the size AA battery is carried out in use of a size AA battery at the size AA battery holder of dedication, since it will become a configuration almost equivalent to one nickel hydoride battery, this is replaced with, loaded with and used for a nickel hydoride battery. Moreover, there is also an usable thing alternatively about a lithium ion (Li-ion) cell and a size AA battery.
[0003]
[Problem(s) to be Solved by the Invention] However, since properties, such as the deterioration, also differ, unless a configuration not only differs from capacity, but it uses it in consideration of these properties, the desired camera engine performance is not obtained, or two or more kinds of cells have a possibility of causing deterioration of the cell itself.
[0004] The purpose of this invention prevents the bad influence by the difference in a power supply cell as much as possible, and even if it is the same cell, it is to offer the feeder system for a camera and cameras which enabled it to attain high efficiency by changing operation.
[0005]
[Means for Solving the Problem] Two or more kinds of power supply cells by which properties differ are usable cameras alternatively, and a camera concerning invention of claims 1-5 identifies a class of power supply cell, possesses a control means which controls camera actuation according to the discernment result, and, thereby, solves the above-mentioned trouble. Especially invention of claim 2 responds to the above-mentioned discernment result, and permits / forbids use of a specific function. Invention of claim 3 is equipped with an information means for reporting to a photography person, and changes an information gestalt about a specific function according to a discernment result. Invention of claim 4 includes a property's of power supply cell deterioration property according to a self-sustaining property and/or operation. As for invention of claim 5, two or more different kinds of a property of power supply cells contain a lithium ion battery and a nickel hydoride battery at least. A camera concerning invention of claims 6 and 7 is a camera which uses two or more power supply cells, and prepares a switch mechanism which switches whether two or more power supply cells are used by series connection, or it is used by parallel connection. Invention of claim 7 is especially equipped further with a control means which controls camera actuation according to a series connection condition or a parallel connection condition. A feeder system for cameras concerning invention of claim 8 switches to a battery compartment where it is alternatively loaded with two or more kinds of power supply cells by which properties differ in mechanism according to a class of loaded power supply cell, and is equipped with a signal output means to

output a cell recognition signal. A feeder system for cameras concerning invention of claim 9 is equipped with a switchable change over device in a battery compartment where it is loaded with two or more power supply cells, and the condition of changing parallel connection into the condition of carrying out series connection of said two or more power supply cells while it has been in a fixed cell loading condition. A feeder system for cameras concerning invention of claim 10 is a feeder system for cameras which equipped a pars basilaris ossis occipitalis with a tripod seat while having a battery compartment where it is loaded with two or more power supply cells, in order to position two or more power supply cells, it protrudes a projection for positioning on an inside of a battery compartment, and a location of a tripod seat is set that a tripod seat is located between a gap or two power supply cells which be positioned by projection. When the 1st and 2nd power supply cell by which configurations differ has alternatively a battery compartment with which it can load, two or more cell contacts corresponding to two or more 1st power supply cells are prepared in a battery compartment, respectively and it is loaded with the 2nd power supply cell, a feeder system for cameras concerning invention of claim 11 is constituted so that a part of two or more cell contacts may be used. A camera concerning invention of claim 12 has a feeder system of claim 10 or claim 11.

[0006]

[Embodiment of the Invention] - Explain the 1st operation gestalt at the time of applying this invention to the battery pack for digital still cameras (feeder system) by the 1st operation gestalt- drawing 1 - drawing 4 . the digital still camera of this operation gestalt -- a nickel hydoride battery, a lithium ion battery, and AA -- a form primary cell is alternatively usable and the electric supply of it to a camera is attained by equipping the main part of a camera with the battery pack of dedication. In addition, a camera independent is usable, without equipping with a battery pack.

[0007] Drawing 1 - drawing 3 show the condition of having equipped the battery compartment BC of a battery pack with each cell. This battery pack is a thing of a type which protruded on the upper surface and which ****s, and thrusts and equips the tripod screw-thread hole of the main part pars basilaris ossis occipitalis of a camera with 11. An illustration longitudinal direction corresponds to a camera longitudinal direction. 12 is a disk member for ****ing and rotating 11, and the part has exposed it operational from the side of the main part of a battery pack.

[0008] The lithium ion battery BLi shown in drawing 1 holds two cels in one cell package, and changes. Since one cel is 3.7V, it is set to 7.4V as one lithium ion battery BLi. With this operation gestalt, it loads with these two lithium ion batteries BLi, and it is parallel and is used. In addition, it is usable one lithium ion battery. On the other hand, the nickel hydoride battery BNi shown in drawing 2 is 1 cel 1.2V, holds six cels in one cell package, and uses them as a cell of 7.2V. Moreover, the size AA battery BAA shown in drawing 3 carries out six-piece series connection of the thing of 1 piece 1.5V, and it is used for it by 9V. The size AA battery holder HL which holds a size AA battery possible [6 series connection] is prepared, and a lithium ion battery BLi and a nickel hydoride battery BNi are replaced with and equipped with this holder HL.

[0009] 15a (+), 15b (-), 16a (+), and 16b (-) are cell contacts, and in order to carry out parallel connection of the two lithium ion batteries BLi, they are prepared 1 set of right and left at a time. Among these, any 1 set of (+)(-) cell contacts (15a, 15b, 16a and 16b, 15a and 16b, or 15b, 16a) are used also as nickel hydrogen or a cell contact at the time of size AA battery loading (since series connection of nickel hydrogen and the size AA battery BAA is carried out, they are good only at 1 set).

[0010] The projection 13 almost for cell positioning to a mid gear of a longitudinal direction protrudes on the upper surface of a battery compartment BC. Although one both sides are loaded with two lithium ion batteries BLi at a time on both sides of projection 13, they are positioned by projection 13 in that case. Moreover, that configuration is set that positioning is made also for a nickel hydoride battery BNi and the size AA battery holder HL using this projection 13. And the tripod seat 14 is formed just under this projection 13. The screw-thread hole for fixing a tripod and 1 piece to the tripod seat 14 is prepared, and the camera which equipped with the battery pack using this is fixed to a tripod.

[0011] Here, since the upper part of the tripod seat 14 is projected in the battery compartment BC like illustration, it becomes the obstacle of cell loading with some of the arrangement location. If it is

made for the tripod seat 14 not to project in a battery compartment BC, although interference with a cell can be prevented, in this case, thickness of the pars basilaris ossis occipitalis of a battery pack must be thickened, and its height size will increase it. When arranging the tripod seat 14 just under the projection 13 and it loads with a lithium ion battery BLi like drawing 1 , even if the tripod seat 14 will be located between two lithium ion batteries BLi positioned by the projection 13 and the tripod seat 14 has projected in the battery compartment BC, it does not interfere with Cell BLi. If it puts in another way, the tripod seat 14 can be made to be able to project in a battery compartment BC by arranging the tripod seat 14 just under projection 13, and, thereby, the height size of a battery pack can be stopped to the minimum.

[0012] Next, the property of each cell is explained. A lithium ion battery BLi is large capacity compared with a nickel hydoride battery BNi, and when using two lithium ion batteries BLi like this operation gestalt, it has one about 1.5 times the capacity of this compared with the case where one nickel hydoride battery BNi is used. That is, compared with a nickel hydoride battery BNi, a self-sustaining property is high. Moreover, there is also an advantage that there is no memory effect (it mentions later) which poses a problem with a nickel hydoride battery BNi. On the other hand, a lithium ion battery BLi is weak at low temperature, and the engine performance deteriorates according to a high current (rushes current), and it has the defect of contracting a life.

[0013] On the other hand, although the engine performance does not deteriorate according to a high current, a nickel hydoride battery BNi is inferior to a lithium ion battery BLi in capacity, and has a defect of a memory effect. If a recharge is performed without discharging the power in a cell completely, a cell will memorize the charge level at that time, and if after re-discharge reaches the level, a memory effect will mean the property of stopping an electric power supply, although power remains. In addition, while a size AA battery BAA is more sharply [in capacity / than two previous rechargeable batteries] inferior and has a defect, like a voltage drop is intense, it has the advantage of being easy to receive although it is general-purpose therefore.

[0014] Thus, since three kinds of cells had a different property, respectively, they restricted camera actuation according to the property of the cell with which it is loaded with this operation gestalt. In order to identify the cell with which it is loaded first, as shown in drawing 1 - drawing 3 , two switches SW1 and SW2 were formed in the battery compartment BC. These switches SW1 and SW2 consist of the electric contact piece of a pair, and are formed in the tip of the projection 13 of a battery compartment BC which protruded in the middle mostly, and one medial surface of a battery compartment BC, respectively.

[0015] A switch SW1 holds an OFF state, when loaded with a lithium ion battery BLi like drawing 1 , and when loaded with nickel hydoride battery BNi and the size AA battery holder HL like drawing 2 and drawing 3 , one contact piece will contact the contact piece of another side by Cell BNi and being pushed holder HL, and it will be in an ON state. On the other hand, a switch SW2 is pushed only when loaded with a nickel hydoride battery BNi, it switches on, and an OFF state is held when loaded with lithium ion battery BLi and the size AA battery holder HL. The on-off condition of switches SW1 and SW2 is transmitted to CPU21 (drawing 4) by the side of a camera as a cell recognition signal, and, thereby, CPU21 identifies the class of cell with which it is loaded. That is, by ON, if both SW1 and SW2 are off and both the lithium ion batteries BLiSW1 and SW2 are ON, if SW2 is off as for the nickel hydoride battery BNiSW1, it will judge like a size AA battery BAA.

[0016] The drive circuit 22 of Motor M, the display circuit 23, and the luminescence circuit 24 of flash equipment are connected to CPU21 again. Although one motor M was shown, two or more motors, such as a motor for popping up / bringing down the light-emitting part of the sequence motor which drives a mirror, drawing, a shutter, etc. in fact, and built-in flash equipment, are included. Moreover, although the digital still camera is assumed with this operation gestalt, if it is a film-based camera, a film feed motor is also contained. A display circuit 23 drives the liquid crystal display monitor 25 for an image check prepared in the main part of a camera. In addition, about the electric supply path, illustration is omitted from the battery pack.

[0017] Next, the example of processing of CPU21 is explained. CPU21 will perform cell distinction by the above-mentioned switches SW1 and SW2, if the main switch of a camera is turned on or it is newly loaded with a cell. And the following control is performed according to the cell with which it is loaded. First, about a seriography (continuous shooting), if it is BLi, it is the seriography

prohibition BNi and it is the seriography authorization BAA, it will consider as seriography prohibition. That is, if a seriography is performed at high speed, a high current will flow, but since a lithium ion battery BLi has the defect that the engine performance deteriorates according to a high current, the seriography in a lithium ion battery BLi forbids it. On the other hand, although a nickel hydoride battery BNi is small capacity compared with a lithium ion battery BLi, since it is rare for the engine performance to deteriorate according to a high current, a seriography is permitted. Moreover, since capacity is also small and the voltage drop is intense, a seriography forbids a size AA battery BAA.

[0018] the photography person here, "forbids a seriography" -- the seriography mode from 1 ****** mode -- a change -- as like -- the change -- inhibition -- things are meant. Moreover, when seriography mode is already set up, it switches to 1 ****** mode compulsorily. It is desirable to warn of the purport of seriography prohibition synchronizing with this (information). Or a seriography is not forbidden but only warning is. That is, at the time of a lithium ion battery BLi or a size AA battery BAA, for a seriography to warn of an unsuitable purport, and what is necessary is just made to warn of the purport which can perform a seriography satisfactory at the time of a nickel hydoride battery BNi. As these warnings, lighting of the alarm display by the above-mentioned liquid crystal display monitor 25 or other liquid crystal displays and LED for warning or generating of a beep sound can be considered.

[0019] Moreover, you may make it continuous-shooting speed change continuous-shooting speed in an adjustable thing according to the power supply cell with which it was loaded. For example, if it is BLi, it is 2 pieces / second BNi and it is 5 pieces / second BAA, it is possible to carry out like 1 piece / second. That is, since a lithium ion battery BLi will not deteriorate, either, if it is not a high-speed seriography so much, the speed is restricted and a seriography is permitted.

[0020] In the case of the camera which was equipped with flash equipment of a pop-up method which was furthermore mentioned above, and was equipped with the automatic pop-up function which takes a photograph by popping up automatically at the time of necessity, it is good even if [like / if it is BLi, it is the ban BNi on automatic pop up and it is the automatic pop-up authorization BAA / the ban on flash photography]. Automatic pop up is forbidden for preventing that a high current flows by reducing the actuation at the time of the photography immediately after pop up at the time of a lithium ion battery BLi. In addition, since capacity is small, a size AA battery BAA forbids the flash luminescence itself.

[0021] moreover, since it needs much power, if a liquid crystal display monitor 25 is BLi, it can always [monitor] be used -- if it is BNi -- a monitor -- use is possible conditional -- if it is BAA, it is good also as monitor use being impossible. That is, although use of a liquid crystal display monitor 25 is always permitted in the mass lithium ion battery BLi, use is conditionally permitted in the nickel hydoride battery BNi with a capacity smaller than it. conditional -- although a liquid crystal display monitor 25 cannot be used as a finder substitute about use, for example, the check of a photography image can be possible or can consider the reverse. Moreover, the display is permitted at the time of a lithium ion battery BLi and a liquid crystal display monitor 25, and you may make it forbid after photography of one piece only at the time of a size AA battery BAA by what only fixed time amount displays a photography image on a liquid crystal display monitor as.

[0022] In view of a lithium ion battery being still weaker at low temperature, ambient temperature is under predetermined temperature, and when loaded with the lithium ion battery, it may be made to perform warning which stimulates a changing battery. Moreover, in order to avoid a memory effect, it may be made to warn of the purport which charges after discharging completely, when loaded with a nickel hydoride battery.

[0023] In addition, although the example which equips with and uses the battery pack as a feeder system for the main part of a camera was shown above, a feeder system can apply this invention also to what is beforehand united with the main part of a camera.

[0024] - Explain 2nd operation gestalt -, next the 2nd operation gestalt of this invention. Drawing 5 and drawing 6 are the block diagrams showing the control system of the camera system in this operation gestalt. The system which consists of a camera and a feeder system is meant, these may be unified beforehand, and a camera system here may have removable feeder systems, such as a battery pack, to a camera like a previous operation gestalt. In addition, the same sign is given to the same

component as a previous operation gestalt.
[0025] Although [this camera system] two lithium ion batteries BLi are usable, it is switchable by switches SW11-SW13 in whether these are used by parallel connection, or it uses by series connection. Switches SW11-SW13 are located between a cell, and the DC/DC circuit 31, and are switched by actuation of the predetermined operating member 32. an operating member 32 -- for example, the external surface of a camera or a battery pack -- a slide -- it is prepared operational and it is supposed between a serial location and a juxtaposition location that it is operational.
[0026] Drawing 5 shows the condition that an operating member 21 is in a juxtaposition location, and ON and a switch SW13 have off switches SW11 and SW12, and it serves as parallel connection. The supply voltage at this time is 7.4V. If an operating member 32 is operated in a serial location, as shown in drawing 6 , switches SW11 and SW12 serve as OFF, a switch SW13 serves as ON, series connection of the cell BLi will be carried out, and supply voltage will be set to 14.8V. Thus, since a serial/juxtaposition was switched using the switches SW11-SW13 which switch by actuation, it is not necessary to change the loading location and the loading direction of a cell in the change. That is, a serial/juxtaposition can be switched with a fixed cell loading condition.
[0027] Proper use of choosing series connection when the one where supply voltage is higher performs high-speed continuous shooting in view of what can be performed at high speed (since Motor M can be rotated at high speed), and choosing parallel connection at the time of others is [in / the above configuration] possible for continuous-shooting speed. The actuation condition of the above-mentioned operating member 32 is inputted into CPU21, and, thereby, CPU21 judges the connection condition of the power supply cell BLi. And at the time of series connection, the display of the purport in which high-speed continuous shooting is possible is performed using liquid crystal display monitor 25 grade. For example, at the time of series connection, it may be made to perform a display like "3 Piece/second" at the time of "5 Piece/second", and parallel connection.
[0028] Moreover, what is necessary is to choose series connection, when it is necessary to process at high speed also except a seriography, and just to choose parallel connection, in being other. Or what is necessary is just to choose parallel connection to, carry out long duration use of the power supply cell if possible. Moreover, what is necessary is just to drop voltage on DC / DC circuit 31 about the processing which does not need the high voltage so much even if it is in a series connection condition. It ends with circuitry [lower / rather than it generally raises supply voltage] being easier, and a space is also small and ends.
[0029] in addition -- the above -- a lithium ion battery, a nickel hydoride battery, and AA -- although three kinds of mold primary cells were shown, the cell of other classes can apply this invention also to an usable thing. Moreover, at least two kinds of cells should be just usable. Although the digital still camera furthermore explained, the camera treating a silver halide film may be used.
[0030]
[Effect of the Invention] According to this invention, the following effect is acquired.
(1) Since the class of power supply cell is identified and camera actuation was controlled according to the discernment result, while the camera actuation according to a cell property is attained and the desired camera engine performance is always obtained, deterioration of the cell itself can be prevented.
(2) While choosing series connection and obtaining a desired function when high-speed processing is called for since it was switched whether two or more power supply cells are used by series connection or it is used by parallel connection, when other, the long duration use of the cell can be carried out by choosing parallel connection.
(3) Since the location of a tripod seat was set that a tripod seat is located between the gap or two power supply cells which protrude the projection for positioning on the inside of a battery compartment, and be positioned by projection in order to position two or more power supply cells, even if it makes a part of tripod seat project to the cell interior of a room, it does not interfere with a cell, with the height size of a feeder system or a camera can be made small.
(4) Since it constituted so that the part of two or more cell contacts might be used when the 1st and 2nd power supply cell by which configurations differ was able to load alternatively, two or more cell contacts corresponding to two or more 1st power supply cells were established, respectively and it was loaded with the 2nd power supply cell, the reduction and the cost cut of components mark by

share-izing of a cell contact can be aimed at.

[Translation done.]

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TECHNICAL FIELD

[The technical field to which invention belongs] This invention relates alternatively two or more kinds of cells by which a property differs from a configuration to an usable camera and the feeder system for cameras.

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PRIOR ART

[Description of the Prior Art] the nickel hydrogen rechargeable battery (nickel-MH cell) of the former and dedication, and general-purpose AA -- there is an usable battery pack for cameras alternatively about a form primary cell (the following, size AA battery). Usually, the usage of using a mass nickel hydoride battery and using temporarily the size AA battery which is easy to come to hand when this goes out is common. If two or more (8 [for example,]) wearing of the size AA battery is carried out in use of a size AA battery at the size AA battery holder of dedication, since it will become a configuration almost equivalent to one nickel hydoride battery, this is replaced with, loaded with and used for a nickel hydoride battery. Moreover, there is also an usable thing alternatively about a lithium ion (Li-ion) cell and a size AA battery.

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EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, the following effect is acquired.
(1) Since the class of power supply cell is identified and camera actuation was controlled according to the discernment result, while the camera actuation according to a cell property is attained and the desired camera engine performance is always obtained, deterioration of the cell itself can be prevented.
(2) While choosing series connection and obtaining a desired function when high-speed processing is called for since it was switched whether two or more power supply cells are used by series connection or it is used by parallel connection, when other, the long duration use of the cell can be carried out by choosing parallel connection.
(3) Since the location of a tripod seat was set that a tripod seat is located between the gap or two power supply cells which protrude the projection for positioning on the inside of a battery compartment, and be positioned by projection in order to position two or more power supply cells, even if it makes a part of tripod seat project to the cell interior of a room, it does not interfere with a cell, with the height size of a feeder system or a camera can be made small.
(4) Since it constituted so that the part of two or more cell contacts might be used when the 1st and 2nd power supply cell by which configurations differ was able to load alternatively, two or more cell contacts corresponding to two or more 1st power supply cells were established, respectively and it was loaded with the 2nd power supply cell, the reduction and the cost cut of components mark by share-izing of a cell contact can be aimed at.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, since properties, such as the deterioration, also differ, unless a configuration not only differs from capacity, but it uses it in consideration of these properties, the desired camera engine performance is not obtained, or two or more kinds of cells have a possibility of causing deterioration of the cell itself.
[0004] The purpose of this invention prevents the bad influence by the difference in a power supply cell as much as possible, and even if it is the same cell, it is to offer the feeder system for a camera and cameras which enabled it to attain high efficiency by changing operation.

[Translation done.]

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MEANS

[Means for Solving the Problem] Two or more kinds of power supply cells by which properties differ are usable cameras alternatively, and a camera concerning invention of claims 1-5 identifies a class of power supply cell, possesses a control means which controls camera actuation according to the discernment result, and, thereby, solves the above-mentioned trouble. Especially invention of claim 2 responds to the above-mentioned discernment result, and permits / forbids use of a specific function. Invention of claim 3 is equipped with an information means for reporting to a photography person, and changes an information gestalt about a specific function according to a discernment result. Invention of claim 4 includes a property's of power supply cell deterioration property according to a self-sustaining property and/or operation. As for invention of claim 5, two or more different kinds of a property of power supply cells contain a lithium ion battery and a nickel hydoride battery at least. A camera concerning invention of claims 6 and 7 is a camera which uses two or more power supply cells, and prepares a switch mechanism which switches whether two or more power supply cells are used by series connection, or it is used by parallel connection. Invention of claim 7 is especially equipped further with a control means which controls camera actuation according to a series connection condition or a parallel connection condition. A feeder system for cameras concerning invention of claim 8 switches to a battery compartment where it is alternatively loaded with two or more kinds of power supply cells by which properties differ in mechanism according to a class of loaded power supply cell, and is equipped with a signal output means to output a cell recognition signal. A feeder system for cameras concerning invention of claim 9 is equipped with a switchable change over device in a battery compartment where it is loaded with two or more power supply cells, and the condition of changing parallel connection into the condition of carrying out series connection of said two or more power supply cells while it has been in a fixed cell loading condition. A feeder system for cameras concerning invention of claim 10 is a feeder system for cameras which equipped a pars basilaris ossis occipitalis with a tripod seat while having a battery compartment where it is loaded with two or more power supply cells, in order to position two or more power supply cells, it protrudes a projection for positioning on an inside of a battery compartment, and a location of a tripod seat is set that a tripod seat is located between a gap or two power supply cells which be positioned by projection. When the 1st and 2nd power supply cell by which configurations differ has alternatively a battery compartment with which it can load, two or more cell contacts corresponding to two or more 1st power supply cells are prepared in a battery compartment, respectively and it is loaded with the 2nd power supply cell, a feeder system for cameras concerning invention of claim 11 is constituted so that a part of two or more cell contacts may be used. A camera concerning invention of claim 12 has a feeder system of claim 10 or claim 11.
[0006]
[Embodiment of the Invention] - Explain the 1st operation gestalt at the time of applying this invention to the battery pack for digital still cameras (feeder system) by the 1st operation gestalt- drawing 1 - drawing 4 . the digital still camera of this operation gestalt -- a nickel hydoride battery, a lithium ion battery, and AA -- a form primary cell is alternatively usable and the electric supply of it to a camera is attained by equipping the main part of a camera with the battery pack of dedication. In addition, a camera independent is usable, without equipping with a battery pack.
[0007] Drawing 1 - drawing 3 show the condition of having equipped the battery compartment BC of

a battery pack with each cell. This battery pack is a thing of a type which protruded on the upper surface and which ****s, and thrusts and equips the tripod screw-thread hole of the main part pars basilaris ossis occipitalis of a camera with 11. An illustration longitudinal direction corresponds to a camera longitudinal direction. 12 is a disk member for ****ing and rotating 11, and the part has exposed it operational from the side of the main part of a battery pack.

[0008] The lithium ion battery BLi shown in drawing 1 holds two cels in one cell package, and changes. Since one cel is 3.7V, it is set to 7.4V as one lithium ion battery BLi. With this operation gestalt, it loads with these two lithium ion batteries BLi, and it is parallel and is used. In addition, it is usable one lithium ion battery. On the other hand, the nickel hydoride battery BNi shown in drawing 2 is 1 cel 1.2V, holds six cels in one cell package, and uses them as a cell of 7.2V. Moreover, the size AA battery BAA shown in drawing 3 carries out six-piece series connection of the thing of 1 piece 1.5V, and it is used for it by 9V. The size AA battery holder HL which holds a size AA battery possible [6 series connection] is prepared, and a lithium ion battery BLi and a nickel hydoride battery BNi are replaced with and equipped with this holder HL.

[0009] 15a (+), 15b (-), 16a (+), and 16b (-) are cell contacts, and in order to carry out parallel connection of the two lithium ion batteries BLi, they are prepared 1 set of right and left at a time. Among these, any 1 set of (+)(-) cell contacts (15a, 15b, 16a and 16b, 15a and 16b, or 15b, 16a) are used also as nickel hydrogen or a cell contact at the time of size AA battery loading (since series connection of nickel hydrogen and the size AA battery BAA is carried out, they are good only at 1 set).

[0010] The projection 13 almost for cell positioning to a mid gear of a longitudinal direction protrudes on the upper surface of a battery compartment BC. Although one both sides are loaded with two lithium ion batteries BLi at a time on both sides of projection 13, they are positioned by projection 13 in that case. Moreover, that configuration is set that positioning is made also for a nickel hydoride battery BNi and the size AA battery holder HL using this projection 13. And the tripod seat 14 is formed just under this projection 13. The screw-thread hole for fixing a tripod and 1 piece to the tripod seat 14 is prepared, and the camera which equipped with the battery pack using this is fixed to a tripod.

[0011] Here, since the upper part of the tripod seat 14 is projected in the battery compartment BC like illustration, it becomes the obstacle of cell loading with some of the arrangement location. If it is made for the tripod seat 14 not to project in a battery compartment BC, although interference with a cell can be prevented, in this case, thickness of the pars basilaris ossis occipitalis of a battery pack must be thickened, and its height size will increase it. When arranging the tripod seat 14 just under the projection 13 and it loads with a lithium ion battery BLi like drawing 1 , even if the tripod seat 14 will be located between two lithium ion batteries BLi positioned by the projection 13 and the tripod seat 14 has projected in the battery compartment BC, it does not interfere with Cell BLi. If it puts in another way, the tripod seat 14 can be made to be able to project in a battery compartment BC by arranging the tripod seat 14 just under projection 13, and, thereby, the height size of a battery pack can be stopped to the minimum.

[0012] Next, the property of each cell is explained. A lithium ion battery BLi is large capacity compared with a nickel hydoride battery BNi, and when using two lithium ion batteries BLi like this operation gestalt, it has one about 1.5 times the capacity of this compared with the case where one nickel hydoride battery BNi is used. That is, compared with a nickel hydoride battery BNi, a self-sustaining property is high. Moreover, there is also an advantage that there is no memory effect (it mentions later) which poses a problem with a nickel hydoride battery BNi. On the other hand, a lithium ion battery BLi is weak at low temperature, and the engine performance deteriorates according to a high current (rushes current), and it has the defect of contracting a life.

[0013] On the other hand, although the engine performance does not deteriorate according to a high current, a nickel hydoride battery BNi is inferior to a lithium ion battery BLi in capacity, and has a defect of a memory effect. If a recharge is performed without discharging the power in a cell completely, a cell will memorize the charge level at that time, and if after re-discharge reaches the level, a memory effect will mean the property of stopping an electric power supply, although power remains. In addition, while a size AA battery BAA is more sharply [in capacity / than two previous rechargeable batteries] inferior and has a defect, like a voltage drop is intense, it has the advantage

of being easy to receive although it is general-purpose therefore.
[0014] Thus, since three kinds of cells had a different property, respectively, they restricted camera actuation according to the property of the cell with which it is loaded with this operation gestalt. In order to identify the cell with which it is loaded first, as shown in drawing 1 - drawing 3 , two switches SW1 and SW2 were formed in the battery compartment BC. These switches SW1 and SW2 consist of the electric contact piece of a pair, and are formed in the tip of the projection 13 of a battery compartment BC which protruded in the middle mostly, and one medial surface of a battery compartment BC, respectively.
[0015] A switch SW1 holds an OFF state, when loaded with a lithium ion battery BLi like drawing 1 , and when loaded with nickel hydoride battery BNi and the size AA battery holder HL like drawing 2 and drawing 3 , one contact piece will contact the contact piece of another side by Cell BNi and being pushed holder HL, and it will be in an ON state. On the other hand, a switch SW2 is pushed only when loaded with a nickel hydoride battery BNi, it switches on, and an OFF state is held when loaded with lithium ion battery BLi and the size AA battery holder HL. The on-off condition of switches SW1 and SW2 is transmitted to CPU21 (drawing 4) by the side of a camera as a cell recognition signal, and, thereby, CPU21 identifies the class of cell with which it is loaded. That is, by ON, if both SW1 and SW2 are off and both the lithium ion batteries BLiSW1 and SW2 are ON, if SW2 is off as for the nickel hydoride battery BNiSW1, it will judge like a size AA battery BAA.
[0016] The drive circuit 22 of Motor M, the display circuit 23, and the luminescence circuit 24 of flash equipment are connected to CPU21 again. Although one motor M was shown, two or more motors, such as a motor for popping up / bringing down the light-emitting part of the sequence motor which drives a mirror, drawing, a shutter, etc. in fact, and built-in flash equipment, are included. Moreover, although the digital still camera is assumed with this operation gestalt, if it is a film-based camera, a film feed motor is also contained. A display circuit 23 drives the liquid crystal display monitor 25 for an image check prepared in the main part of a camera. In addition, about the electric supply path, illustration is omitted from the battery pack.
[0017] Next, the example of processing of CPU21 is explained. CPU21 will perform cell distinction by the above-mentioned switches SW1 and SW2, if the main switch of a camera is turned on or it is newly loaded with a cell. And the following control is performed according to the cell with which it is loaded. First, about a seriography (continuous shooting), if it is BLi, it is the seriography prohibition BNi and it is the seriography authorization BAA, it will consider as seriography prohibition. That is, if a seriography is performed at high speed, a high current will flow, but since a lithium ion battery BLi has the defect that the engine performance deteriorates according to a high current, the seriography in a lithium ion battery BLi forbids it. On the other hand, although a nickel hydoride battery BNi is small capacity compared with a lithium ion battery BLi, since it is rare for the engine performance to deteriorate according to a high current, a seriography is permitted. Moreover, since capacity is also small and the voltage drop is intense, a seriography forbids a size AA battery BAA.
[0018] the photography person here, "forbids a seriography" -- the seriography mode from 1 ****** mode -- a change -- as like -- the change -- inhibition -- things are meant. Moreover, when seriography mode is already set up, it switches to 1 ****** mode compulsorily. It is desirable to warn of the purport of seriography prohibition synchronizing with this (information). Or a seriography is not forbidden but only warning is. That is, at the time of a lithium ion battery BLi or a size AA battery BAA, for a seriography to warn of an unsuitable purport, and what is necessary is just made to warn of the purport which can perform a seriography satisfactory at the time of a nickel hydoride battery BNi. As these warnings, lighting of the alarm display by the above-mentioned liquid crystal display monitor 25 or other liquid crystal displays and LED for warning or generating of a beep sound can be considered.
[0019] Moreover, you may make it continuous-shooting speed change continuous-shooting speed in an adjustable thing according to the power supply cell with which it was loaded. For example, if it is BLi, it is 2 pieces / second BNi and it is 5 pieces / second BAA, it is possible to carry out like 1 piece / second. That is, since a lithium ion battery BLi will not deteriorate, either, if it is not a high-speed seriography so much, the speed is restricted and a seriography is permitted.
[0020] In the case of the camera which was equipped with flash equipment of a pop-up method

which was furthermore mentioned above, and was equipped with the automatic pop-up function which takes a photograph by popping up automatically at the time of necessity, it is good even if [like / if it is BLi, it is the ban BNi on automatic pop up and it is the automatic pop-up authorization BAA / the ban on flash photography]. Automatic pop up is forbidden for preventing that a high current flows by reducing the actuation at the time of the photography immediately after pop up at the time of a lithium ion battery BLi. In addition, since capacity is small, a size AA battery BAA forbids the flash luminescence itself.

[0021] moreover, since it needs much power, if a liquid crystal display monitor 25 is BLi, it can always [monitor] be used -- if it is BNi -- a monitor -- use is possible conditional -- if it is BAA, it is good also as monitor use being impossible. That is, although use of a liquid crystal display monitor 25 is always permitted in the mass lithium ion battery BLi, use is conditionally permitted in the nickel hydoride battery BNi with a capacity smaller than it. conditional -- although a liquid crystal display monitor 25 cannot be used as a finder substitute about use, for example, the check of a photography image can be possible or can consider the reverse. Moreover, the display is permitted at the time of a lithium ion battery BLi and a liquid crystal display monitor 25, and you may make it forbid after photography of one piece only at the time of a size AA battery BAA by what only fixed time amount displays a photography image on a liquid crystal display monitor as.

[0022] In view of a lithium ion battery being still weaker at low temperature, ambient temperature is under predetermined temperature, and when loaded with the lithium ion battery, it may be made to perform warning which stimulates a changing battery. Moreover, in order to avoid a memory effect, it may be made to warn of the purport which charges after discharging completely, when loaded with a nickel hydoride battery.

[0023] In addition, although the example which equips with and uses the battery pack as a feeder system for the main part of a camera was shown above, a feeder system can apply this invention also to what is beforehand united with the main part of a camera.

[0024] - Explain 2nd operation gestalt -, next the 2nd operation gestalt of this invention. Drawing 5 and drawing 6 are the block diagrams showing the control system of the camera system in this operation gestalt. The system which consists of a camera and a feeder system is meant, these may be unified beforehand, and a camera system here may have removable feeder systems, such as a battery pack, to a camera like a previous operation gestalt. In addition, the same sign is given to the same component as a previous operation gestalt.

[0025] Although [this camera system] two lithium ion batteries BLi are usable, it is switchable by switches SW11-SW13 in whether these are used by parallel connection, or it uses by series connection. Switches SW11-SW13 are located between a cell, and the DC/DC circuit 31, and are switched by actuation of the predetermined operating member 32. an operating member 32 -- for example, the external surface of a camera or a battery pack -- a slide -- it is prepared operational and it is supposed between a serial location and a juxtaposition location that it is operational.

[0026] Drawing 5 shows the condition that an operating member 21 is in a juxtaposition location, and ON and a switch SW13 have off switches SW11 and SW12, and it serves as parallel connection. The supply voltage at this time is 7.4V. If an operating member 32 is operated in a serial location, as shown in drawing 6 , switches SW11 and SW12 serve as OFF, a switch SW13 serves as ON, series connection of the cell BLi will be carried out, and supply voltage will be set to 14.8V. Thus, since a serial/juxtaposition was switched using the switches SW11-SW13 which switch by actuation, it is not necessary to change the loading location and the loading direction of a cell in the change. That is, a serial/juxtaposition can be switched with a fixed cell loading condition.

[0027] Proper use of choosing series connection when the one where supply voltage is higher performs high-speed continuous shooting in view of what can be performed at high speed (since Motor M can be rotated at high speed), and choosing parallel connection at the time of others is [in / the above configuration] possible for continuous-shooting speed. The actuation condition of the above-mentioned operating member 32 is inputted into CPU21, and, thereby, CPU21 judges the connection condition of the power supply cell BLi. And at the time of series connection, the display of the purport in which high-speed continuous shooting is possible is performed using liquid crystal display monitor 25 grade. For example, at the time of series connection, it may be made to perform a display like "3 Piece/second" at the time of "5 Piece/second", and parallel connection.

[0028] Moreover, what is necessary is to choose series connection, when it is necessary to process at high speed also except a seriography, and just to choose parallel connection, in being other. Or what is necessary is just to choose parallel connection to, carry out long duration use of the power supply cell if possible. Moreover, what is necessary is just to drop voltage on DC / DC circuit 31 about the processing which does not need the high voltage so much even if it is in a series connection condition. It ends with circuitry [lower / rather than it generally raises supply voltage] being easier, and a space is also small and ends.
[0029] in addition -- the above -- a lithium ion battery, a nickel hydoride battery, and AA -- although three kinds of mold primary cells were shown, the cell of other classes can apply this invention also to an usable thing. Moreover, at least two kinds of cells should be just usable. Although the digital still camera furthermore explained, the camera treating a silver halide film may be used.

[Translation done.]

* NOTICES *

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the cross section showing the configuration of the battery pack in the 1st operation gestalt, and the condition at the time of lithium ion battery loading is shown.
[Drawing 2] It is the same drawing as drawing 1 , and the condition at the time of nickel hydoride battery loading is shown.
[Drawing 3] the same drawing as drawing 1 -- it is -- AA -- the condition at the time of form primary-cell loading is shown.
[Drawing 4] Drawing showing the control system of the camera with which it is equipped with the above-mentioned battery pack.
[Drawing 5] It is control-block drawing of the camera system in the 2nd operation gestalt, and the condition that parallel connection of the cell was carried out is shown.
[Drawing 6] It is the same drawing as drawing 5 , and the condition that series connection of the cell was carried out is shown.
[Description of Notations]
13 Projection for Positioning
14 Tripod Seat
21 CPU
22 Drive Circuit
23 Display Circuit
24 Luminescence Circuit
25 Liquid Crystal Display Monitor
BC Battery compartment
BLi Lithium ion battery
BNi Nickel hydoride battery
BAA AA -- form primary cell
M Motor
SW1, SW2 Switch for cell discernment
SW11-SW13 Switch a serial / for juxtaposition change over

[Translation done.]

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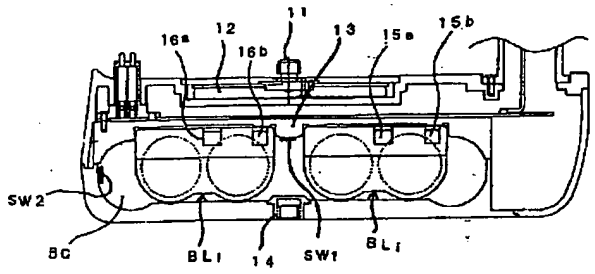
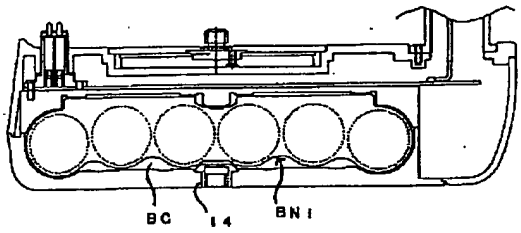
DRAWINGS

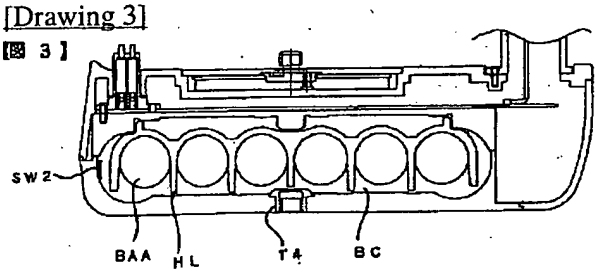
[Drawing 1]
【図１】



[Drawing 2]
【図２】

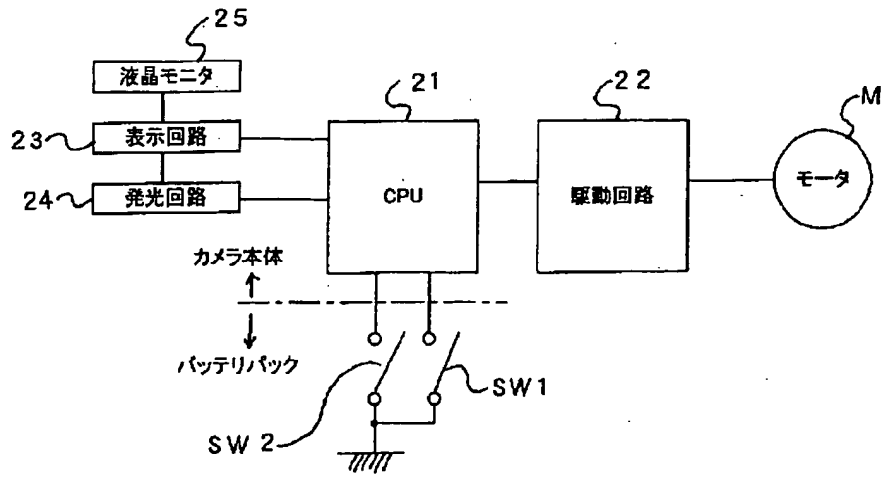


[Drawing 3]
【図３】



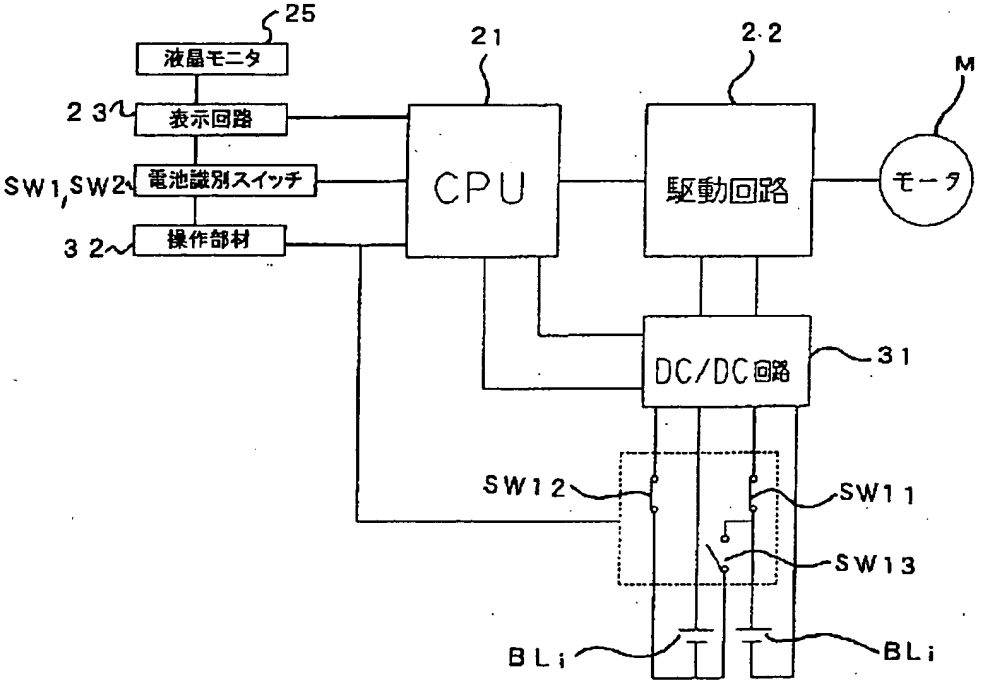
[Drawing 4]

【図4】

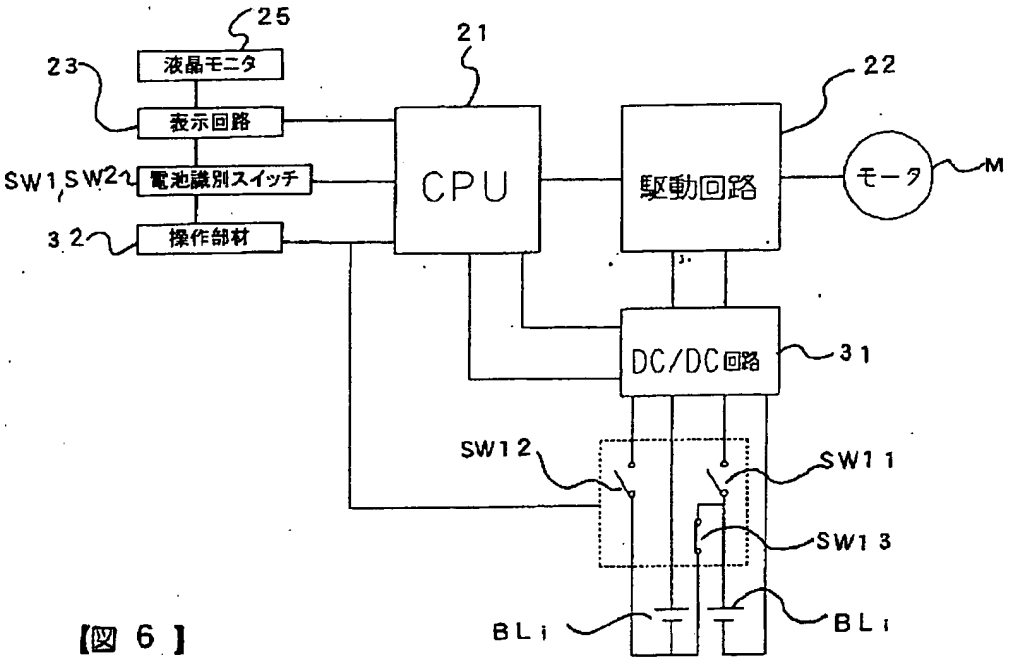


[Drawing 5]

【図 5】



[Drawing 6]



【図 6】

[Translation done.]